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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/734,512	12/12/2003	John Pease	NFC1P014D1_D1	9997

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IP CREATORS
P. O. BOX 2789
CUPERTINO, CA 95015

EXAMINER	
GONZALEZ, JULIO C	

ART UNIT	PAPER NUMBER
2834	

DATE MAILED: 07/08/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/734,512	PEASE ET AL.	
	Examiner	Art Unit	
	Julio C. Gonzalez	2834	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 22-27 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 22-27 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 12 December 2003 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 12/12/03.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 22-27 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 22, it is disclosed that the duration of each pulse is maintain. What is meant by the "duration"? Amplitude? Time? Frequency? Period? What is specifically meant by "maintain"? a constant time?

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 22 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Falagas in view of Linday et al and Yoshida et al.

Falangas discloses a piezo element 20, a method of controlling a piezo actuator (see figure 1) by using a digital to analog converter 42, and using an amplifying means 22 for amplifying a signal. Moreover, feedback may be used in the system (see figures 5, 6A-6C, 7A-7C).

Although it is well known in the art that pulses are converter from digital to analog, Falangas does not disclose explicitly using digitized pulses with a rising edge and a falling edge.

On the other hand, Lindsay et al discloses for the purpose of using efficiently the gain required for optimal operations that it is known to use digitized signals for controlling moving members (see figures 3, 6A, 6B, column 3, lines 21-28).

However, neither Falangas nor Lindsay et al disclose explicitly increasing the speed of movement of the position members.

On the other hand, Yoshida et al discloses for the purpose of providing a transducer that functions efficiently by employing driving pulses that it is known in the art to increase the speed of moving members by increasing the frequency (column 3, lines 52-60). Moreover, the reference teaches inherently that the interval between pulses decreases since it is known in the art that by increasing the frequency, the interval between signals (pulses) decreases.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to design a controlling system for a piezo actuator as disclosed by Falangas and to modify the invention by explicitly disclosing that digitized pulses may be used for controlling a moving member for the purpose of using efficiently the gain required for optimal operations as disclosed by Lindsay et al and to increase the movement of the members by increasing the frequency for the purpose of providing a transducer that functions efficiently by employing driving pulses as disclosed by Yoshida et al.

5. Claims 23 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Falagas, Lindsay et al and Yoshida et al as applied to claim 22 above, and further in view of Takahata et al.

The combined controlling system for a piezo actuator discloses all of the elements above. However, the combined system does not disclose explicitly using the average slope of signals.

On the other hand, Takahata et al discloses for the purpose of reducing noise in mechanical vibration systems, a controlling system using piezo devices (see figures 6A-6C) wherein average slopes of pulses are used (see figures 7, 9, 14, 18, 19, 23, 24, 27).

Moreover, Takahata et al discloses storing data of sequences that is directly related to the pulses (column 15, line 64 – column 16, line 1).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to design the combined controlling system for a piezo actuator as disclosed above and to use the average slope of signals for the purpose of reducing noise in mechanical vibration systems as disclosed by Takahata et al.

6. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Falagas, Lindsay et al and Yoshida et al as applied to claim 22 above, and further in view of Basch.

The combined controlling system for a piezo actuator discloses all of the elements above. However, the combined system does not disclose using an electrical sink.

On the other hand, Basch discloses for the purpose of controlling efficiently output loads for drive signal to piezo elements, an electrical sink being used in a circuit including piezo elements (column 3, lines 57-64).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to design the combined controlling system for a piezo actuator as disclosed above and to modify the invention by using

a sink for the purpose of controlling efficiently output loads for drive signal to piezo elements as disclosed by Basch.

Allowable Subject Matter

7. Claim 26 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Julio C. Gonzalez whose telephone number is 571-272-2024. The examiner can normally be reached on M-F (8AM-5PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Darren Schuberg can be reached on 571-272-2044. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Thomas M. Dougherty
THOMAS M. DOUGHERTY
PRIMARY EXAMINER
GROUP 2100

Jcg